

Appendix C

Supporting Data

2006 PLOO Stations

Demersal Fishes and Megabenthic Invertebrates

Appendix C.1

Summary of demersal fish species captured during 2006 at PLOO stations. Data are number of fish collected (n), biomass (BM) (wet weight, kg), minimum (Min), maximum (Max), and mean length (cm). Taxonomic arrangement and scientific names are of Eschmeyer and Herald (1998) and Allen (2005).*

Taxon/Species	Common name	n	BM	Length		
				Min	Max	Mean
RAJIFORMES Rajidae						
<i>Raja inornata</i>	California skate	6	0.9	10	42	23
<i>Raja stellulata</i>	starry skate	2	0.2	23	24	24
CHIMAERIFORMES Chimaeridae						
<i>Hydrolagus colliei</i>	spotted ratfish	3	0.5	29	38	35
AULOPIFORMES Synodontidae						
<i>Synodus lucioceps</i>	California lizardfish	47	1.5	9	24	16
OSMERIFORMES Argentinidae						
<i>Argentina sialis</i>	Pacific argentine	15	0.3	4	7	6
OPHIDIIFORMES Ophidiidae						
<i>Chilara taylori</i>	spotted cuskeel	4	0.2	15	17	16
BATRACHOIDIFORMES Batrachoididae						
<i>Porichthys notatus</i>	plainfin midshipman	84	1.7	6	17	12
SCORPAENIFORMES Scorpaenidae						
<i>Scorpaena guttata</i>	California scorpionfish	7	2.4	15	25	20
<i>Sebastes chlorostictus</i>	greenspotted rockfish	1	0.1	15	15	15
<i>Sebastes elongatus</i>	greenstriped rockfish	39	1.3	6	13	10
<i>Sebastes eos</i>	pink rockfish	18	0.6	5	11	8
<i>Sebastes jordani</i>	shortbelly rockfish	1	0.1	12	12	12
<i>Sebastes hopkinsi</i>	squarespot rockfish	1	0.1	11	11	11
<i>Sebastes rosenblatti</i>	greenblotched rockfish	19	0.8	7	12	10
<i>Sebastes rubrivinctus</i>	flag rockfish	2	0.5	9	14	12
<i>Sebastes saxicola</i>	stripetail rockfish	59	1.5	6	15	10
<i>Sebastes semicinctus</i>	halfbanded rockfish	1279	19.0	6	14	9
Hexagrammidae						
<i>Ophiodon elongatus</i>	lingcod	1	0.1	25	25	25
<i>Zaniolepis frenata</i>	shortspine combfish	159	4.1	8	17	13
<i>Zaniolepis latipinnis</i>	longspine combfish	320	6.8	7	17	12
Cottidae						
<i>Chitonotus pugetensis</i>	roughback sculpin	47	0.5	7	12	9
<i>Icelinus quadriseriatus</i>	yellowchin sculpin	507	2.2	4	9	7
<i>Icelinus tenuis</i>	spotfin sculpin	27	0.3	8	11	9
Agonidae						
<i>Odontopyxis trispinosa</i>	pygmy poacher	2	0.2	8	8	8
<i>Xeneretmus latifrons</i>	blacktip poacher	5	0.5	3	14	11
<i>Xeneretmus triacanthus</i>	bluespotted poacher	2	0.2	9	14	12
PERCIFORMES						
Sciaenidae						
<i>Genyonemus lineatus</i>	white croaker	2	0.3	19	20	20
Embiotocidae						
<i>Cymatogaster aggregata</i>						
<i>Zalembius rosaceus</i>	pink seaperch	88	1.8	5	13	9
Bathymasteridae						
<i>Rathbunella hypoplecta</i>	bluebanded ronquil	2	0.2	12	17	15

Appendix C.1 *continued*

Taxon/Species	Common name	n	BM	Length		
				Min	Max	Mean
Zoarcidae						
	<i>Lycodopsis pacifica</i>	blackbelly eelpout	17	0.8	16	25
Stichaeidae						
	<i>Plectobranchus evides</i>	bluebarred prickleback	1	0.1	10	10
Scombridae						
	<i>Scomber japonicus</i>	chub mackerel	1	0.1	20	20
PLEURONECTIFORMES						
Paralichthyidae						
	<i>Citharichthys sordidus</i>	Pacific sanddab	2734	51.8	4	23
	<i>Hippoglossina stoma</i>	bigmouth sole	18	1.0	10	14
Pleuronectidae						
	<i>Eopsetta exilis</i>	slender sole	20	0.6	9	16
	<i>Microstomus pacificus</i>	Dover sole	543	13.8	5	20
	<i>Parophrys vetulus</i>	English sole	83	8.2	12	19
	<i>Pleuronichthys verticalis</i>	hornyhead turbot	43	3.1	8	19
Cynoglossidae						
	<i>Sympodus atricauda</i>	California tonguefish	34	0.9	8	14

* Eschmeyer, W. N. and E.S. Herald. (1998). A Field Guide to Pacific Coast Fishes of North America. Houghton and Mifflin Company, New York. 336 p. Allen, M.J. 2005. The check list of trawl-caught fishes for Southern California from depths of 2–265 m. Southern California Research Project, Westminster, CA.

Appendix C.2

Summary of total abundance by species and station for demersal fish at the Point Loma Ocean Outfall trawl stations during 2006. Species abundance value is cumulative for 6 stations.

NAME	January 2006						Species abundance by survey
	SD7	SD8	SD10	SD12	SD13	SD14	
Pacific sanddab	220	181	215	241	309	280	1446
Yellowchin sculpin	162	50	224	7	18	19	480
Halfbanded rockfish	21	90	117	108	16	20	372
Dover sole	9	27	46	189	11	28	310
Longspine combfish	43	43	36	85	43	20	270
Shortspine combfish	8	17	10	25	2	5	67
Plainfin midshipman	23	8	3	8	12	8	62
English sole	2	1	21	11	16	7	58
Pink seaperch	18	5	1	24	2	6	56
Roughback sculpin	20	18			3	1	42
Stripetail rockfish	1	1	12	3	19	5	41
Hornyhead turbot	4	4	5	4	8	2	27
California tonguefish	12	5	1	4	4		26
California lizardfish	14	4		4	2	1	25
Greenstriped rockfish	1	5	4	4	3	3	20
Bigmouth sole	3	9	1		1	1	15
Spotfin sculpin	2	13					15
Blackbelly eelpout				9		4	13
Greenblotched rockfish	1			1	5	2	13
Pink rockfish				1	4		9
California scorpionfish				1	1	4	1
Pacific argentine	2	5					7
Blacktip poacher	1	1				1	3
California skate		1			1	1	3
Spotted ratfish	2	1					3
Bluebanded ronquil		1				1	2
Bluebarred prickleback	1						1
Flag rockfish		1					1
Greenspotted rockfish	1						1
Lingcod		1					1
Pygmy poacher		1					1
Chub mackerel	1						1
Squarespot rockfish		1					1
White croaker	1						1
QUARTER	573	494	699	736	476	422	3400

Appendix C.2 *continued*

NAME	July 2006						Species abundance by survey
	SD7	SD8	SD10	SD12	SD13	SD14	
Pacific sanddab	139	303	222	127	221	276	1288
Halfbanded rockfish	24	9	579	61	3	231	907
Dover sole	27	34	37	34	36	65	233
Shortspine combfish	17	26	13	30	1	5	92
Longspine combfish	10	3	3	16	10	8	50
Pink seaperch	8	3	7	4	3	7	32
Yellowchin sculpin	21		6				27
English sole	1	4	5	3	6	6	25
California lizardfish	6	7	2	1	3	3	22
Plainfin midshipman	10		1	2	8	1	22
Slender sole	5	9	1	5			20
Greenstriped rockfish	1	4	1	6	5	2	19
Stripetail rockfish	2		1		9	6	18
Hornyhead turbot	1	3	3	5	1	3	16
Spotfin sculpin		12					12
Pink rockfish				2	2	5	9
California tonguefish	1	5	2				8
Pacific argentine	8						8
Greenblotched rockfish			1		2	3	6
Roughback sculpin	5						5
Blackbelly eelpout		1			2	1	4
Spotted cuskeel	2				2		4
Bigmouth sole		2	1				3
California skate		1				2	3
Blacktip poacher		1				1	2
Bluespotted poacher	1		1				2
Starry skate		1				1	2
Flag rockfish						1	1
Pygmy poacher		1					1
Shortbelly rockfish			1				1
White croaker		1					1
QUARTER	289	430	887	296	314	627	2843
GRAND TOTAL	862	924	1586	1032	790	1049	6243

Appendix C.3

Summary of total biomass by species and station for demersal fish collected at the Point Loma Ocean Outfall trawl stations during 2006. Biomass is slightly overestimated due to weights less than 0.1kg.

Name	January 2006						Biomass by survey
	SD7	SD8	SD10	SD12	SD13	SD14	
Pacific sanddab	1.8	2.5	3.5	3.3	5.1	1.3	17.5
Longspine combfish	1.0	1.5	0.6	1.4	0.7	0.5	5.7
English sole	0.1	0.1	1.5	1.4	1.6	1.0	5.7
Dover sole	0.1	0.7	1.0	2.8	0.2	0.7	5.5
Halfbanded rockfish	0.2	1.4	1.5	1.5	0.4	0.3	5.3
California scorpionfish			0.4	0.2	1.2	0.6	2.4
Yellowchin sculpin	0.6	0.1	1.0	0.1	0.1	0.1	2.0
Hornyhead turbot	0.3	0.1	0.3	0.4	0.6	0.1	1.8
Shortspine combfish	0.1	0.4	0.2	0.5	0.1	0.1	1.4
Pink seaperch	0.3	0.1	0.1	0.5	0.1	0.1	1.2
Stripetail rockfish	0.1	0.1	0.2	0.1	0.3	0.1	0.9
California lizardfish	0.1	0.4		0.2	0.1	0.1	0.9
Bigmouth sole	0.1	0.4	0.1		0.1	0.1	0.8
Plainfin midshipman	0.2	0.1	0.1	0.1	0.2	0.1	0.8
California skate			0.1		0.1	0.5	0.7
California tonguefish	0.2	0.1	0.1	0.1	0.1		0.6
Greenstriped rockfish	0.1	0.1	0.1	0.1	0.1	0.1	0.6
Spotted ratfish	0.3	0.2					0.5
Blackbelly eelpout				0.4		0.1	0.5
Greenblotched rockfish	0.1		0.1	0.1	0.1	0.1	0.5
Roughback sculpin	0.1	0.1			0.1	0.1	0.4
Blacktip poacher	0.1	0.1				0.1	0.3
Pink rockfish			0.1	0.1		0.1	0.3
Bluebanded ronquil		0.1				0.1	0.2
Pacific argentine	0.1	0.1					0.2
Spotfin sculpin	0.1	0.1					0.2
Bluebarred prickleback	0.1						0.1
Chub mackerel	0.1						0.1
Flag rockfish		0.1					0.1
Greenspotted rockfish	0.1						0.1
Lingcod		0.1					0.1
Pygmy poacher		0.1					0.1
Squarespot rockfish		0.1					0.1
White croaker	0.1						0.1
QUARTER	6.5	9.3	10.9	13.3	11.3	6.4	57.7

Appendix C.3 *continued*

Name	July 2006						Biomass by survey
	SD7	SD8	SD10	SD12	SD13	SD14	
Pacific sanddab	2.5	4.8	3.4	2.5	10.6	10.5	34.3
Halfbanded rockfish	0.4	0.1	5.8	1.1	0.1	6.2	13.7
Dover sole	1.0	1.1	1.2	1.0	1.5	2.5	8.3
Shortspine combfish	0.4	0.8	0.2	1.1	0.1	0.1	2.7
English sole	0.1	0.3	0.6	0.3	0.6	0.6	2.5
Hornyhead turbot	0.1	0.2	0.3	0.4	0.1	0.2	1.3
Longspine combfish	0.3	0.1	0.1	0.2	0.2	0.2	1.1
Plainfin midshipman	0.3		0.1	0.1	0.3	0.1	0.9
Greenstriped rockfish	0.1	0.1	0.1	0.2	0.1	0.1	0.7
Slender sole	0.1	0.3	0.1	0.1			0.6
California lizardfish	0.1	0.1	0.1	0.1	0.1	0.1	0.6
Pink seaperch	0.1	0.1	0.1	0.1	0.1	0.1	0.6
Stripetail rockfish	0.1		0.1		0.2	0.2	0.6
Flag rockfish						0.4	0.4
Blackbelly eelpout		0.1			0.1	0.1	0.3
California tonguefish	0.1	0.1	0.1				0.3
Greenblotched rockfish				0.1	0.1	0.1	0.3
Pink rockfish					0.1	0.1	0.3
Bigmouth sole		0.1	0.1				0.2
Blacktip poacher		0.1				0.1	0.2
Bluespotted poacher	0.1		0.1				0.2
California skate		0.1				0.1	0.2
Spotted cuskeel	0.1				0.1		0.2
Starry skate		0.1				0.1	0.2
White croaker		0.2					0.2
Yellowchin sculpin	0.1		0.1				0.2
Pacific argentine	0.1						0.1
Pygmy poacher		0.1					0.1
Roughback sculpin	0.1						0.1
Shortbelly rockfish			0.1				0.1
Spotfin sculpin		0.1					0.1
QUARTER	6.2	9.0	12.8	7.3	14.4	21.9	71.6
GRAND TOTAL	12.7	18.3	23.7	20.6	25.7	28.3	129.3

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Appendix C.4

Summary of inter-group dissimilarity from the SIMPER procedure in PRIMER. Data are dissimilarity/standard deviation values for species that best discriminate between groups (i.e., dissimilarity/standard deviation ≥ 1.5). AD=average dissimilarity between groups.

Appendix C.4 *continued*

Appendix C5

List of megabenthic invertebrate taxa collected at PLOO stations SD7–SD14 during 2006 surveys. (N) = total number of individuals collected. Taxonomic arrangement from SCAMIT 2001.*

Taxon/Species	N
PORIFERA	
Demospongiae	
Hadromerida	
Suberitidae	
<i>Suberites suberea</i>	2
CNIDARIA	
ANTHOZOA	
Alcyonacea	
Muriceidae	
<i>Thesea</i> sp B	3
Pennatulacea	
Virgulariidae	
<i>Acanthoptilum</i> sp	734
Actiniaria	
Metridiidae	
<i>Metridium farcimen</i>	2
MOLLUSCA	
GASTROPODA	
Neotaeniglossa	
Ovulidae	
<i>Neosimnia barbarensis</i>	1
Neogastropoda	
Nassariidae	
<i>Nassarius insculptus</i>	1
Cancellariidae	
<i>Cancellaria cooperii</i>	1
<i>Cancellaria crawfordiana</i>	1
Turridae	
<i>Megasurcula carpenteriana</i>	3
Cephalaspidea	
Philinidae	
<i>Philine auriformis</i>	1
Notaspidea	
Pleurobranchidae	
<i>Pleurobranchaea californica</i>	14
Nudibranchia	
Platydordidae	
<i>Platydoris macfarlandi</i>	1
Tritoniidae	
<i>Tritonia diomedea</i>	6
Arminidae	
<i>Armina californica</i>	4
CEPHALOPODA	
Sepiolida	
Sepiolidae	
<i>Rossia pacifica</i>	8
Octopoda	
Octopodidae	
<i>Octopus rubescens</i>	21

Appendix C.5 *continued*

Taxon/Species	N
HOLOTHURIODEA	
Aspidochirotida	
Stichopodidae	
<i>Parastichopus californicus</i>	55
*[SCAMIT] The Southern California Association of Marine Invertebrate Taxonomists. (2001). A taxonomic listing of soft bottom macro- and megabenthic invertebrates from infaunal and epibenthic monitoring programs in the Southern California Bight; Edition 4. SCAMIT. San Pedro, CA.	

Appendix C.6

Summary of total abundance by species and station for megabenthic invertebrates at the Point Loma Ocean Outfall trawl stations during 2006. Species abundance value is cumulative for 6 stations.

NAME	January 2006						Species abundance by survey
	SD7	SD8	SD10	SD12	SD13	SD14	
<i>Lytechinus pictus</i>	2025	3825	2160	740	500	42	9292
<i>Allocentrotus fragilis</i>				27	46	193	266
<i>Acanthoptilum</i> sp			15	75	11	1	102
<i>Luidia foliolata</i>	7	12	7	7	18	12	63
<i>Sicyonia ingentis</i>	40	2	1	2	1	3	49
<i>Ophiura luetkenii</i>	20		3		6	2	31
<i>Astropecten verrilli</i>	6			10	1	1	18
<i>Parastichopus californicus</i>	3	3	3	2	5		16
<i>Octopus rubescens</i>	2	5	2		4		13
<i>Florometra serratissima</i>	1	7					8
<i>Rossia pacifica</i>	3	1		2			6
<i>Pleurobranchaea californica</i>	1			1	2	1	5
<i>Platymera gaudichaudii</i>	1				3		4
<i>Spatangus californicus</i>	2	1				1	4
<i>Armina californica</i>				3			3
<i>Luidia asthenosoma</i>	3						3
<i>Thesea</i> sp B	1		1			1	3
<i>Metridium farcimen</i>				1			1
<i>Nassarius insculptus</i>				1			1
<i>Neocrangon zacae</i>	1						1
<i>Ophiothrix spiculata</i>	1						1
<i>Paguristes turgidus</i>						1	1
<i>Philine auriformis</i>					1		1
<i>Suberites suberea</i>						1	1
QUARTER	2117	3856	2203	862	597	258	9893

Appendix C.6 *continued*

July 2006

NAME	Species abundance by survey						
	SD7	SD8	SD10	SD12	SD13	SD14	
<i>Lytechinus pictus</i>	1600	3200	1800	1350	508	140	8598
<i>Allocentrotus fragilis</i>	1	7	15	123	263	252	661
<i>Acanthoptilum</i> sp				600	30	2	632
<i>Luidia foliolata</i>	6		8	20	1	10	45
<i>Parastichopus californicus</i>	14	17	1	6	1		39
<i>Sicyonia ingentis</i>	28	1	4	5	1		39
<i>Florometra serratissima</i>	2	7			1	1	11
<i>Astropecten verrilli</i>		4	3	2			9
<i>Pleurobranchaea californica</i>				8	1		9
<i>Octopus rubescens</i>	1	2	1		2	2	8
<i>Spatangus californicus</i>					1	6	7
<i>Paguristes turgidus</i>	1	2			1	2	6
<i>Tritonia diomedea</i>	2		3			1	6
<i>Brissopsis pacifica</i>	1	4					5
<i>Ophiura luetkenii</i>				3	1	1	5
<i>Megasurcula carpenteriana</i>				1	2		3
<i>Platymera gaudichaudii</i>	2			1			3
<i>Rossia pacifica</i>	1		1				2
<i>Armina californica</i>					1		1
<i>Cancellaria cooperii</i>			1				1
<i>Cancellaria crawfordiana</i>				1			1
<i>Hemisquilla californiensis</i>		1					1
<i>Henricia leviuscula</i>	1						1
<i>Metridium farcimen</i>					1		1
<i>Neosimnia barbarensis</i>				1			1
<i>Ophiothrix spiculata</i>					1		1
<i>Paralithodes californiensis</i>	1						1
<i>Platydoris macfarlandi</i>				1			1
<i>Podochela hemphillii</i>						1	1
<i>Podochela lobifrons</i>	1						1
<i>Suberites suberea</i>					1		1
QUARTER	1662	3245	1838	2123	814	419	10101
GRAND TOTAL	3779	7101	4041	2985	1411	677	19994

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